AD-A048 947 AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB OHIO F/G 20/1
USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK. VOLUME 109. MK-3A TE--ETC(U)
DEC 76 N A FARINACCI

UNCLASSIFIED AMRL-TR-75-50-VOL-109 NL

1 of 1
ADA048 947

END
DATE FILMED
2-78
DDC

AD A048947

AD No.
DDC FILE COPY

(14) AMRL-TR-75-50-VOL-109
Volume 109

2 NW

(6)

USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK.

Volume 109.

MK-3A Test Stand, Aircraft System, Electric Motor-Driven.

DDC
JAN 25 1978
F

(9) Technical rept.,

(10) Dick A. / Farinacci

(11) DEC [redacted] 76

(12) 18 p.

(16) 7231 (17) 04

Approved for public release; distribution unlimited.

AEROSPACE MEDICAL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

009 850

NOTICES

When US Government drawings, specifications, or other data are used for any purpose other than a definitely related Government procurement operation, the Government thereby incurs no responsibility nor any obligation whatsoever, and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise, as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Please do not request copies of this report from Aerospace Medical Research Laboratory. Additional copies may be purchased from:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Federal Government agencies and their contractors registered with Defense Documentation Center should direct requests for copies of this report to:

Defense Documentation Center
Cameron Station
Alexandria, Virginia 22314

TECHNICAL REVIEW AND APPROVAL

This report has been reviewed by the Information Office (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER

HENNING E. VON GIERKE
Director
Biodynamics and Bionics Division
Aerospace Medical Research Laboratory

AIR FORCE/56780/19 December 1977 — 300

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: AMRL-TR-75-50, Vol. 109
2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER

4. TITLE *(and Subtitle)*: USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK: MK-3A Test Stand, Aircraft System, Electric Motor-Driven

5. TYPE OF REPORT & PERIOD COVERED: Volume 109 of a series

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s): Nick A. Farinacci, Capt, USAF, BSC

8. CONTRACT OR GRANT NUMBER(s)

9. PERFORMING ORGANIZATION NAME AND ADDRESS: Aerospace Medical Research Laboratory, Aerospace Medical Division, Air Force Systems Command, Wright-Patterson AFB OH 45433

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 62202F 7231-04-33 7231-04-36

11. CONTROLLING OFFICE NAME AND ADDRESS: Same as above

12. REPORT DATE: December 1976

13. NUMBER OF PAGES: 18

14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*

15. SECURITY CLASS. *(of this report)*: Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*: Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

DDC JAN 23 1976 RECEIVED E

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*
Noise
Noise Environments
Bioenvironmental Noise
Ground Support Equipment
MK-3A Test Stand, Aircraft System, Electric Motor-Driven

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The MK-3A Hydraulic Test Stand is an electric motor-driven unit designed to pressurize and test aircraft hydraulic systems. This report provides measured data defining the bioacoustic environments produced by this unit operating inside a large aircraft hanger at normal rated conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application," AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under Project/Task 723104, Measurement and Prediction of Noise Environments of Air Force Operations.

The author acknowledges the efforts of Mr. Robert T. England and Mr. Robert G. Powell who conducted the field measurements, and Mr. John N. Cole who established the data analysis requirements and assisted in the preparation of this report. Mr. Henry Mohlman and Mr. David Eilerman of the University of Dayton assisted in the mechanics of data processing, and Mrs. Norma Peachey typed and prepared the graphics.

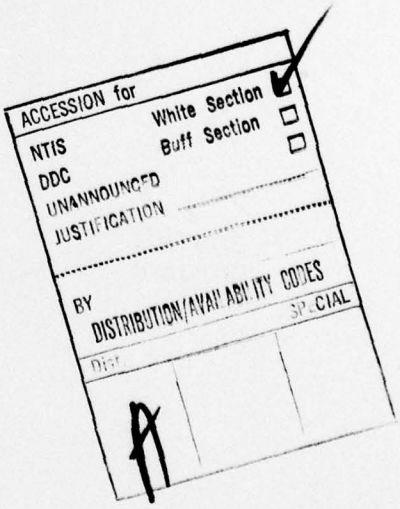

Table of Contents

Page

INTRODUCTION 3

NEAR-FIELD NOISE 4

List of Tables

NEAR-FIELD NOISE

1. Measurement Location and Test Condition for Operator Noise Measurements 4
2. Measured Sound Pressure Level
   - 1/3 Octave Band 6-8
   - Octave Band 9-11
3. Measures of Human Noise Exposure 12-14

List of Figures

NEAR-FIELD NOISE

1. Measurement Locations 5

INTRODUCTION

The MK-34 Hydraulic Test Stand is an electric motor-driven unit designed to pressurize and test aircraft hydraulic systems. This unit is manufactured by the Sprague Engineering and Sales Corporation.

This volume provides measured data defining the bioacoustic environments produced by this unit. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with operations of the MK-3A test stand.

This volume is one of a series published by the Aerospace Medical Research Laboratory (AMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type, noise data in the handbook describe the noise produced during *ground operations* of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Volume 2 provides a method and data for adjusting the handbook's far-field noise data, which are for standard meteorological conditions (15C temperature, 70% rel humidity, 0.760 meters Hg barometric pressure) to derive comparable data for other meteorological conditions. *Refer to Volumes 1 and 2* (references 1 and 2) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published, and is available upon request from AMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of the updated index as it is generated.

Direct any questions concerning the technical data in this report and other handbook volumes to: AMRL/BBE, Wright-Patterson AFB, OH 45433; Autovon 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

1. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content and Application,* AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

2. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 2: Procedure to Evaluate Effects of Non-standard Meteorological Conditions on Far-Field Noise,* AMRL-TR-75-50 (2), AMRL, WPAFB, OH, 1975.

NEAR-FIELD NOISE

MEASUREMENTS

A standard MK-3A Test Stand was operated inside, and approximately in the center of a large aircraft hanger (190.5 m long × 95.1 m wide × 18.3 m high) on a concrete floor at a normal rated condition of the system pressurized at 3000 PSI, no flow. The hanger walls and ceiling were not acoustically treated. No aircraft were in the vicinity of the unit while being measured. No far-field acoustic data were acquired because of the relatively close proximity of the hanger walls.

Figure 1 identifies 36 noise measurement locations at a height of 1.5 meters above the concrete apron (nominal ear level of ground crew). The 0 degree reference direction passes through the tow bar. These locations are in the acoustic near-field of the source where the sound wave fronts generally do not spherically diverge and the source appears to be spatially distributed (i.e., not a point source). Consequently, these near-field data cannot be extrapolated to longer distances but do properly define the levels at locations close to the unit.

Near-field measurements were also made at ear level at the operator control panel. Table 1 lists the numeric/alphabetic designators used on the data pages in this report to identify the operator measurement location and test conditions. The designator 1/A means operator location 1 and test condition A. Such a descriptor is essential in many handbook volumes that involve multiple combinations of locations/conditions. It is used in this report to maintain format consistency.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced by the MK-3A unit at the 37 specified, near-field locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data one can calculate the variety of measures in Table 3 which are widely used to assess the effects of noise on personnel and their performance.

For data at other intermediate near-field locations (i.e., for radial distances less than 4 meters) you can interpolate between the 36 measured data points.

TABLE 1

MEASUREMENT LOCATION AND TEST CONDITION
FOR OPERATOR NOISE MEASUREMENTS

MK-3A Test Stand, Aircraft Hydraulic System, Electric Motor-Driven
Edwards AFB, 22 Sep 1972

Measurement Location	
1	Operator Control Panel
Operation	
A	System Pressurized at 3000 PSI, No Flow

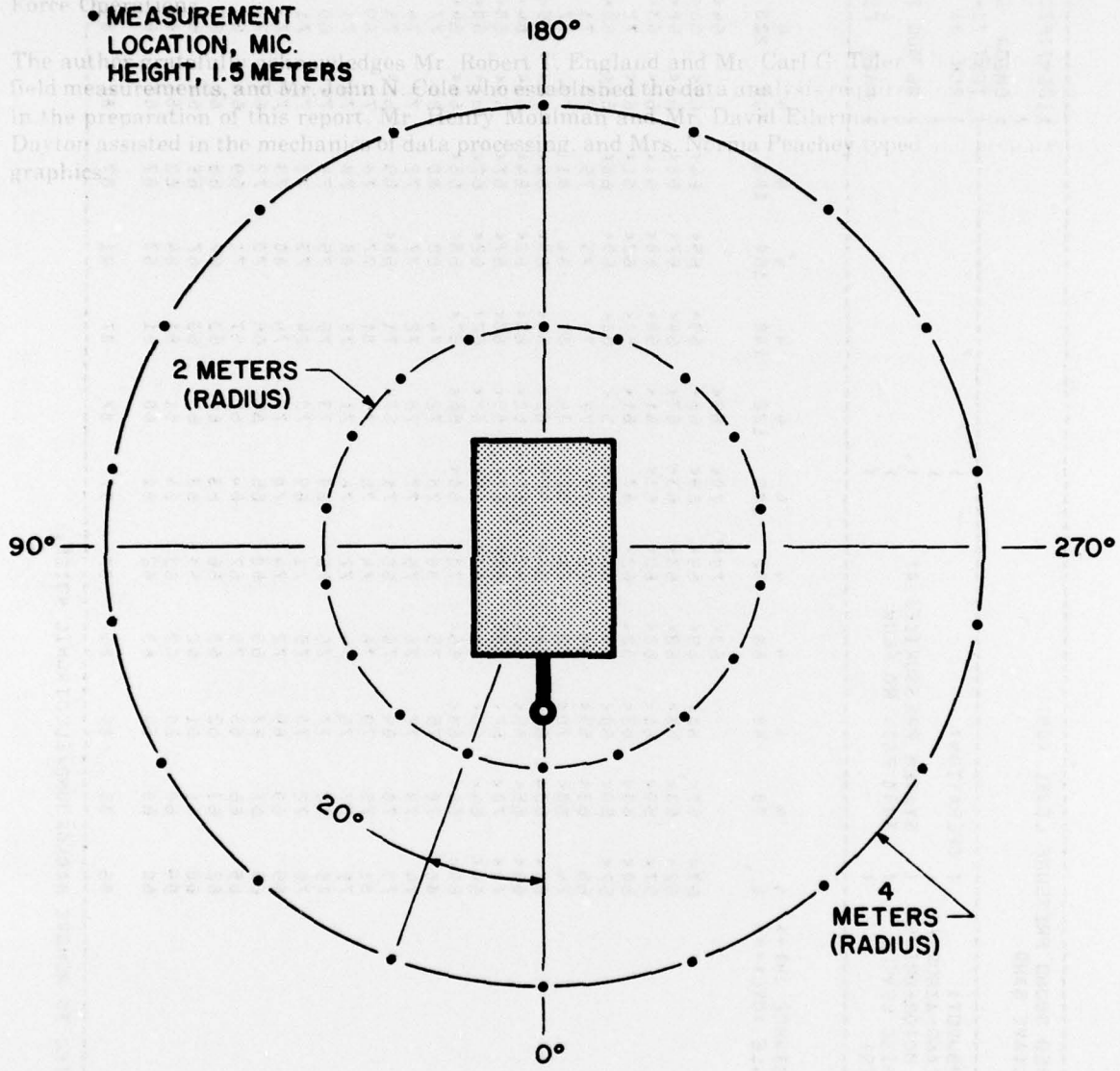

Figure 1. Measurement Locations

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB) 1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 71-020-340
RUN 01
26 AUG 74
PAGE F1

NOISE SOURCE/SUBJECT: MK-3A TEST STAND-AIRCRAFT SYS., ELECT. MOTOR-DRIVEN NEAR FIELD NOISE LEVELS (INSIDE HANGER)

OPERATION: SYSTEM PRESSURIZED AT 3000 PSI, NO FLOW

FREQ (HZ)	DISTANCE (M) -> / ANGLE (DEG) -->	4 / 0	4 / 20	4 / 40	4 / 60	4 / 80	4 / 100	4 / 120	4 / 140	4 / 160	4 / 180	4 / 200	4 / 220	4 / 240
25					63<	70<	70<	69<					64<	
31.5		67<	67<	68<	69<	69<	69<	68<	69<	65<	64<	65<	66<	66<
40		62<	63<	63<	62<	63<	63<	63<	64<	57<	58<	62<	58<	60
50		57<	59<	61<	60<	60<	61<	61<	58<	60<	61<	64<	63<	63<
63		60<	60<	62<	62<	62<	67	61<	59<	62<	61<	65<	72	65<
80		57<	59<	60<	60<	63<	64<	64<	60<	60<	60<	62<	63<	62<
100		68	63<	65<	68	75	75	77	76	75	75	73	71	68
125		74	68<	70<	72	81	82	84	82	81	81	79	77	73
160		63<	63<	63<	64<	68<	65<	65<	64<	63<	64<	64<	65<	66<
200		66<	65<	64<	62<	62<	61<	62<	63<	62<	64<	63<	64<	63<
250		70<	70<	67<	65<	68<	67<	65<	68<	67<	67<	68<	68<	66<
315		64<	64<	63<	61<	63<	64<	62<	62<	62<	62<	61<	60<	61<
400		69<	66<	68<	66<	70<	68<	68<	67<	68<	66<	66<	64<	65<
500		80	78	75	75	80	78	72	74	80	80	83	77	85
630		74	79	77	76	75	77	78	72	77	72	77	74	80
800		70	70	69	70	68<	71	67<	71	68<	69	68<	71	69
1000		81	75	79	76	74	76	73	81	77	78	72	69	81
1250		75	77	76	74	77	76	71	75	88	78	78	71	81
1600		75	72	77	76	75	69	73	75	75	76	73	69	77
2000		70	72	70	75	71	69	70	74	73	71	73	71	75
2500		69	69	69	72	74	70	70	74	80	73	72	73	71
3150		65	67	68	68	68	66	66	66	70	72	69	71	67
4000		65	66	66	70	67	64	65	67	71	69	68	68	66
5000		62	63	62	63	66	63	61	63	67	66	66	67	65
6300		60	61	61	62	63	63	63	63	67	65	64	66	64
8000		59	60	60	62	63	64	61	61	64	62	63	63	61
10000		60	60	64	63	62	61	60	61	63	62	62	61	60
OVERALL		86	85	85	85	87	87	87	87	91	87	87	84	89

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) 1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 71-020-340
RUN 02
26 AUG 74
PAGE F2

NOISE SOURCE/SUBJECT:
MK-3A TEST STAND-AIRCRAFT SYS., ELECT. MOTOR-DRIVEN NEAR FIELD NOISE LEVELS (INSIDE HANGER)

OPERATION:
SYSTEM PRESSURIZED AT 3000 PSI, NO FLOW

FREQ (HZ)	DISTANCE (M) -> / ANGLE (DEG) -->	4 260	4 280	4 300	4 320	4 340	2 0	2 20	2 40	2 60	2 80	2 100	2 120	2 140
25							62<	63<	62<	62<	62<	63<	62<	62<
31.5		66<	64<	63<	63<	64<	70<	71<	71<	70<	70<	70<	69<	68<
40		66<			57<		60<	59<	65<	58<	58<	58<	58<	59<
50		72	60<	59<	58<	56<	61<	62<	65	59<	59<	59<	59<	60<
63		65<	63<	63<	61<	61<	69	71	67	66<	65<	64<	64<	64<
80		61<	69	65<	66<	65<	65<	72	68	68	66<	66<	66<	64<
100		68	64<	66<	66<	68	73	71	70	73	76	78	78	79
125		73	70<	72	72	74	80	77	76	78	82	84	84	85
160		65<	64<	63<	64<	64<	68<	68<	68<	67<	66<	67<	67<	69<
200		65<	63<	64<	64<	66<	71<	70<	66<	63<	64<	65<	66<	66<
250		67<	69<	69<	70<	70<	75	72<	70<	71<	71<	71<	68<	71<
315		63<	66<	63<	65<	64<	71	71	71	70	69	71	70	68
400		65<	66<	65<	67<	67<	73<	73<	74	73<	72<	74	75	74
500		70<	71<	81	80	71<	75	78	76	79	79	82	78	79
630		71	75	73	72	71	78	82	81	77	76	77	76	75
800		68<	69	70	70	71	76	72	73	72	72	71	70	71
1000		83	69	76	76	74	78	76	79	81	78	75	76	80
1250		81	73	73	71	70	76	73	75	76	73	72	74	73
1600		77	72	80	71	73	76	75	77	80	77	68	76	76
2000		72	74	72	69	72	72	69	71	78	72	76	68	69
2500		77	70	69	70	70	70	74	69	74	70	75	71	77
3150		68	66	66	68	67	72	68	71	73	68	71	71	71
4000		64	65	63	65	65	69	67	65	68	68	67	68	67
5000		64	63	63	61	64	65	65	65	67	67	66	65	65
6300		63	62	62	63	63	64	64	64	66	67	65	64	66
8000		63	60	60	60	61	63	62	63	65	65	65	63	63
10000		60	59	59	61	59	62	59	61	64	66	65	62	61
OVERALL		87	83	86	84	83	87	87	87	88	88	89	88	89

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB), 1/3 OCTAVE BAND

IDENTIFICATION: OMEGA 3.2 / TEST 71-020-340 / RUN 03 / 26 AUG 74 / PAGE F3

NOISE SOURCE/SUBJECT: MK-3A TEST STAND-AIRCRAFT SYS., ELECT. MOTOR-DRIVEN NEAR FIELD NOISE LEVELS (INSIDE HANGER)

OPERATION: SYSTEM PRESSURIZED AT 3000 PSI, NO FLOW

FREQ (HZ)	DISTANCE (M) -> / ANGLE (DEG) --> 2 160	2 180	2 200	2 220	2 240	2 260	2 280	2 300	2 320	2 340	OPERATOR LOCATION TEST CONDITION 1/A	2/A
25	63<	62<	70<	69<		62<			63<	62<	65<	
31.5	69<	69<	68<	68<	67<	66<	66<	66<	68<	70<	72	
40	62<	58<	62<	66<	58<	61<	59<	59<	59<	60<	58<	
50	60<	62<	61<	65	61<	60<	59<	58<	59<	59<	63<	57<
63	63<	62<	62<	68	72	67	65<	62<	62<	64<	65<	60<
80	66<	69	69	71	68	64<	64<	64<	64<	63<	66<	
100	78	79	79	78	78	74	73	73	74	73	78	67<
125	84	85	85	84	84	80	80	80	80	79	84	68<
160	66<	67<	69<	69<	69<	69<	68<	69<	70<	69<	70<	
200	67<	66<	66<	65<	67<	67<	66<	67<	67<	70<	70<	
250	71<	69<	71<	69<	70<	67<	68<	70<	73	74	75	71<
315	69	69	70	67<	69	67<	67<	66<	70	69	68	65<
400	75	74	71<	72<	74	71<	73<	69<	70<	73<	76	70<
500	83	85	76	78	84	74	84	78	78	81	93	81
630	79	79	81	81	80	75	78	76	81	80	88	70
800	69	73	71	71	72	71	72	74	75	76	75	70
1000	80	76	83	86	75	77	78	77	78	77	87	80
1250	76	73	77	79	71	73	74	72	72	75	81	70
1600	82	83	78	71	72	72	82	72	71	76	88	72
2000	76	79	77	77	78	73	75	77	75	71	83	73
2500	76	84	77	72	76	73	76	73	72	72	80	70
3150	73	78	77	69	71	73	74	72	73	72	79	72
4000	70	74	72	68	70	70	70	68	68	70	78	75
5000	70	72	72	69	68	69	68	66	67	66	75	71
6300	69	74	68	70	70	67	68	67	67	66	75	70
8000	68	71	67	67	67	67	66	65	64	65	73	70
10000	69	69	65	65	67	68	65	66	63	62	71	68
OVERALL	90	92	90	91	90	86	89	87	87	88	97	86

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

NOISE SOURCE/SUBJECT: MK-3A TEST STAND-AIRCRAFT SYS., ELECT. MOTOR-DRIVEN NEAR FIELD NOISE LEVELS (INSIDE HANGER)

OPERATION: SYSTEM PRESSURIZED AT 3000 PSI, NO FLOW

IDENTIFICATION: OMEGA 3.2 TEST 71-020-340 RUN 01 26 AUG 74 PAGE J1

FREQ (HZ)	DISTANCE (M) -> / ANGLE (DEG) -->	4 / 0	4 / 20	4 / 40	4 / 60	4 / 80	4 / 100	4 / 120	4 / 140	4 / 160	4 / 180	4 / 200	4 / 220	4 / 240
31.5		68	68	69	71	73	73	72	71	66	65	67	68	70
63		63	64	66	66	67	69	67	64	66	65	69	73	68
125		75	70	72	74	82	83	85	83	82	82	80	78	75
250		72	72	70	68	70	69	68	70	69	70	70	70	69
500		81	82	79	79	82	81	79	76	82	81	84	79	86
1000		82	79	81	78	79	79	76	82	88	81	79	75	84
2000		76	76	78	79	78	74	76	79	82	78	78	76	80
4000		69	70	70	72	72	69	69	70	74	74	73	74	71
8000		64	65	66	67	67	67	66	66	70	68	68	68	67
OVERALL		86	85	85	85	87	87	87	87	91	87	87	84	89

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 71-020-340
RUN 02
26 AUG 74
PAGE J2

NOISE SOURCE/SUBJECT:
MK-3A TEST STAND-AIRCRAFT SYS., ELECT. MOTOR-DRIVEN NEAR FIELD NOISE LEVELS (INSIDE HANGER)

OPERATION:
SYSTEM PRESSURIZED AT 3000 PSI, NO FLOW

FREQ (HZ) / DISTANCE (M) -> / ANGLE (DEG) -->	4 260	4 280	4 300	4 320	4 340	2 0	2 20	2 40	2 60	2 80	2 100	2 120	2 140
31.5	69			64		71	71	72	71	71	71	70	70
63	73	70	68	68	67	71	75	71	70	69	69	69	68
125	75	72	73	73	75	81	78	77	79	83	85	85	86
250	70	71	71	72	72	78	76	74	74	73	74	73	74
500	74	77	82	81	75	80	84	83	81	81	84	81	81
1000	85	75	78	78	76	81	79	81	83	80	78	79	81
2000	81	77	81	75	76	78	78	78	83	79	79	77	80
4000	70	70	69	70	70	74	71	72	75	72	73	73	73
8000	67	65	65	66	66	68	67	67	69	70	69	68	68
OVERALL	87	83	86	84	83	87	87	87	88	88	89	88	89

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

NOISE SOURCE/SUBJECT: MK-3A TEST STAND-AIRCRAFT SYS., ELECT. MOTOR-DRIVEN NEAR FIELD NOISE LEVELS (INSIDE HANGER)

OPERATION: SYSTEM PRESSURIZED AT 3000 PSI, NO FLOW

IDENTIFICATION: OMEGA 3.2 TEST 71-020-340 RUN 03

26 AUG 74

PAGE J3

FREQ (HZ)	DISTANCE (M) -> 2	2	2	2	2	2	2	2	2	2	OPERATOR LOCATION TEST CONDITION 1/A	2/A
	ANGLE (DEG) --> 160	180	200	220	240	260	280	300	320	340		
31.5	71	70	72	72	67	69	67	67	70	71	73	
63	68	70	70	73	74	70	68	67	67	68	69	62
125	85	86	86	85	85	81	81	81	81	80	85	70
250	74	73	74	72	74	71	72	73	75	76	76	72
500	85	86	82	83	85	78	85	80	83	84	94	82
1000	82	79	84	87	78	79	80	79	80	81	88	81
2000	84	87	82	79	80	77	83	79	78	78	89	77
4000	76	80	79	73	75	76	76	74	75	75	82	78
8000	73	76	72	73	73	72	71	71	69	69	78	74
OVERALL	90	92	90	91	90	86	89	87	87	88	97	86

TABLE: MEASURES OF HUMAN NOISE EXPOSURE

3

IDENTIFICATION:
OMEGA 3.2
TEST 71-020-340
RUN 01
26 AUG 74
PAGE H1

NOISE SOURCE/SUBJECT:
MK-3A TEST STAND-AIRCRAFT SYS., ELECT. MOTOR-DRIVEN NEAR FIELD NOISE LEVELS (INSIDE HANGER)

OPERATION:
SYSTEM PRESSURIZED AT 3000 PSI, NO FLOW

DISTANCE (M) ->	4	4	4	4	4	4	4	4	4	4	4	4	4	
ANGLE (DEG) -->	0	20	40	60	80	100	120	140	160	180	200	220	240	
HAZARD/PROTECTION														
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR														
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR														
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)														
NO PROTECTION														
OASLC	86	85	85	84	87	86	87	87	91	87	87	84	89	
OASLA	85	84	84	84	84	83	82	85	90	85	85	82	88	
T	404	480	480	480	480	571	679	404	170	404	404	679	240	
MINIMUM QPL EAR MUFFS														
OASLA*	61	59	59	59	63	63	65	63	65	63	63	60	64	
T	960	960	960	960	960	960	960	960	960	960	960	960	960	
AMERICAN OPTICAL 1700 EAR MUFFS														
OASLA*	55	54	53	53	58	58	60	58	59	58	58	55	58	
T	960	960	960	960	960	960	960	960	960	960	960	960	960	
V-51R EAR PLUGS														
OASLA*	61	59	59	58	59	59	57	59	64	60	60	56	63	
T	960	960	960	960	960	960	960	960	960	960	960	960	960	
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS														
OASLA*	47	45	46	44	45	45	45	47	52	46	46	42	49	
T	960	960	960	960	960	960	960	960	960	960	960	960	960	
H-133 GROUND COMMUNICATION UNIT														
OASLA*	58	55	57	56	57	56	56	58	63	58	57	55	59	
T	960	960	960	960	960	960	960	960	960	960	960	960	960	
COMMUNICATION														
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)														
PSIL	80	79	79	79	80	78	77	79	84	80	80	76	83	
ANNOYANCE														
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)														
TONE CORRECTION (C IN DB)														
PNLT	98	96	97	97	99	96	97	99	104	100	100	98	101	
C	3	2	2	1	2	2	3	3	4	3	3	2	3	

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

NOISE SOURCE/SUBJECT: MK-3A TEST STAND-AIRCRAFT SYS., ELECT. MOTOR-DRIVEN NEAR FIELD NOISE LEVELS (INSIDE HANGER)

OPERATION: SYSTEM PRESSURIZED AT 3000 PSI, NO FLOW

IDENTIFICATION: OMEGA 3.2 TEST 71-020-340 RUN 02 26 AUG 74 PAGE H2

DISTANCE (M) ->	4	4	4	4	4	2	2	2	2	2	2	2	2
ANGLE (DEG) -->	260	280	300	320	340	0	20	40	60	80	100	120	140
HAZARD/PROTECTION													
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR													
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR													
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)													
NO PROTECTION													
OASLC	87	83	86	84	83	87	87	87	88	87	89	88	89
OASLA	87	82	85	83	81	85	85	85	87	85	85	84	86
T	285	679	404	571	807	404	404	404	285	404	404	480	339
MINIMUM QPL EAR MUFFS													
OASLA*	60	57	61	60	58	63	63	62	63	64	66	65	66
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS													
OASLA*	54	52	55	54	53	58	57	56	57	59	61	60	61
T	960	960	960	960	960	960	960	960	960	960	960	960	960
V-51R EAR PLUGS													
OASLA*	61	55	59	58	55	60	61	61	61	60	60	59	60
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS													
OASLA*	49	42	45	44	42	47	46	47	48	46	46	46	47
T	960	960	960	960	960	960	960	960	960	960	960	960	960
H-133 GROUND COMMUNICATION UNIT													
OASLA*	61	54	56	54	54	58	57	58	60	57	58	57	59
T	960	960	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION													
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)													
PSIL	80	76	80	78	76	80	80	81	82	80	80	79	81
ANNOYANCE													
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)													
TONE CORRECTION (C IN DB)													
PNLT	100	96	100	97	95	99	99	99	101	99	100	98	101
C	3	2	3	3	1	2	2	2	2	2	2	2	2

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST 71-020-340
RUN 03
26 AUG 74
PAGE H3

NOISE SOURCE/SUBJECT: MK-3A TEST STAND-AIRCRAFT SYS., ELECT. MOTOR-DRIVEN NEAR FIELD NOISE LEVELS (INSIDE HANGER)

OPERATION: SYSTEM PRESSURIZED AT 3000 PSI, NO FLOW

DISTANCE (M) ->	2	2	2	2	2	2	2	2	2	2	OPERATOR LOCATION	
ANGLE (DEG) -->	160	180	200	220	240	260	280	300	320	340	TEST CONDITION	
											1/A	2/A
HAZARD/PROTECTION												
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR												
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR												
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)												
NO PROTECTION												
OASLC	90	92	90	91	89	86	89	86	87	88	97	86
OASLA	88	90	88	89	86	84	88	85	85	86	95	86
T	240	170	240	202	339	480	240	404	404	339	71	339
MINIMUM QPL EAR MUFFS												
OASLA*	67	68	66	66	66	62	65	62	63	64	72	61
T	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS												
OASLA*	61	62	61	61	61	57	59	57	58	58	66	55
T	960	960	960	960	960	960	960	960	960	960	960	960
V-51R EAR PLUGS												
OASLA*	63	63	63	64	62	58	62	59	60	61	71	60
T	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS												
OASLA*	49	49	50	52	47	45	48	45	47	47	56	47
T	960	960	960	960	960	960	960	960	960	960	960	960
H-133 GROUND COMMUNICATION UNIT												
OASLA*	61	64	62	62	58	57	60	57	57	58	66	57
T	960	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION												
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)												
PSIL	83	84	83	83	81	78	83	79	80	81	91	80
ANNOYANCE												
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)												
TONE CORRECTION (C IN DB)												
PNLT	103	107	104	103	101	99	103	99	99	99	109	101
C	2	3	3	4	2	2	3	2	2	1	3	3

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

*U.S.Government Printing Office: 1977 — 757-080/257